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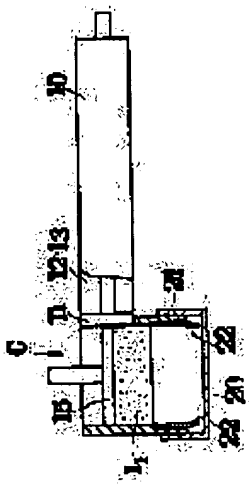
(54) COMPRESSION FILLING METHOD FOR URETHANE FOAM

(57)Abstract:

PURPOSE: To provide the method of even compression filling for urethane foam in a container in which particularly liquid is stored such as a fuel container.

CONSTITUTION: The method is for compressing the unit foams of urethane foam in the short diameter direction (a) and compression filling the urethane foam evenly in a container. Said compression filling method consists of 1) the first process of compressing the given quantity of urethane foam in the short diameter direction of unit foams along guides, 2) the second process of moving the compressed urethane foams in the direction crossing vertically with the first process, and 3) the third process of filling the urethane foams compressed in the container along the guide pieces on the inner wall of the container.



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(54)【発明の名称】　ウレタンフォームの圧縮充填方法

(57)【要約】　(修正有)

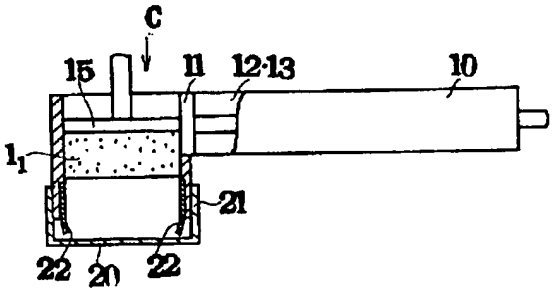
【目的】　この発明は、燃料容器等の、特に内部に液体が貯蔵される容器中に、ウレタンフォームを均一に圧縮充填する方法に関する。

【構成】　ウレタンフォームの単位泡の短径方向ａに圧縮し、容器内に当該ウレタンフォームを均一に圧縮充填する方法であって、

イ．ウレタンフォームをガイドに沿って単位泡の短径方向ａに所定量圧縮する第１工程と、

ロ．前記第１工程と縦に交差する方向に、前記圧縮されたウレタンフォームを移動させる第２工程と、

ハ．容器の内壁に沿うガイド片に沿い、容器内に前記圧縮されたウレタンフォームを充填させる第３工程と、よりなるウレタンフォームの圧縮充填方法。



【特許請求の範囲】
【請求項１】　ウレタンフォームの単位泡の短径方向ａに圧縮し、容器内に当該ウレタンフォームを均一に圧縮充填する方法であって、
イ．ウレタンフォームをガイドに沿って単位泡の短径方向ａに所定量圧縮する第１工程と、
ロ．前記第１工程と縦に交差する方向に、前記圧縮されたウレタンフォームを移動させる第２工程と、
ハ．容器の内壁に沿うガイド片に沿い、容器内に前記圧縮されたウレタンフォームを充填させる第３工程と、よりなるウレタンフォームの圧縮充填方法。
【請求項２】　前記第１工程の後において、圧縮方向と直交する横方向に、若干量圧縮調整する工程を付加した請求項第１項記載のウレタンフォームの圧縮充填方法。
【請求項３】　ガイド及びガイド片は、その表面が摩擦係数の小さい樹脂層にて形成された請求項第１項記載のウレタンフォームの充填方法。
【請求項４】　前記摩擦抵抗の小さい樹脂が、弗素樹脂である請求項第３項記載のウレタンフォームの充填方法。
【発明の詳細な説明】
【０００１】
【産業上の利用分野】この発明は、燃料容器等の、特に内部に液体が貯蔵される容器中に、ウレタンフォームを均一に圧縮充填する方法に関する。
【０００２】
【従来の技術】液体容器において、容器が動的使用状態によって励起される、或る種の問題点がある。それは、動的使用状態で容器内液体が容器内の一端に移動すること、即ち、動的使用状態における容器内液体の移動による液体の重心が移動することによって生じる欠点である。即ち、容器内でのスロッシング現象が生じることである。
【０００３】一方、容器内の液体を排出する場合、容器内の液体が揺動すると、均一な排出を期待することはできない。これら問題点を解決する方策として、液体の移動を防止するため、容器内にウレタンフォーム材を充填するという考え方がある。例えば、特公昭４２－２１０３号公報に開示されている技術がそれであり、これを要約すると、容器内にウレタンフォームを充填せしめ、液体を貯留せしむるもので、容器が動的使用状態にあっても、中の液体の大幅な移動は回避できることを目的としたものである。
【０００４】
【発明が解決しようとする課題】しかしながら、この技術においても次のような問題点がある。即ち、容器内に見合う容積のウレタンフォームが、単に充填されているだけのために、ウレタンフォームにそれほど毛細管現象が期待できず、液体保留能力にも劣り、容器が動的使用状態にあるときは少なからず液体の移動が起り、かつ、液体の排出も均質に行われるとはいい難く、前述の問題点を全面的に解決したものとは言えなかった。
【０００５】この点に関し、容器内にウレタンフォームを圧縮した状態で充填することによってこれらの欠点が取り除かれるという事実が判明したが、圧縮して容器内に充填するに当っての問題点は、ウレタンフォームをむらなく均一に圧縮することは難しいという問題がある。ウレタンフォームに対し単に圧縮を行うと、圧縮のむらが起り、そのむらが筋状となって残り、その筋にそって液が集中して流れ、前記特徴ある容器の効果を発揮することはできない。
【０００６】
【課題を解決するための手段】本発明は上記課題を解決すべく案出されたものであって、次の構成を採用することによって解決を見たものである。即ち、本発明の要旨は、ウレタンフォームの単位泡の短径方向ａに圧縮し、容器内に当該ウレタンフォームを均一に圧縮充填する方法であって、
イ．ウレタンフォームをガイドに沿って単位泡の短径方向ａに所定量圧縮する第１工程と、
ロ．前記第１工程と縦に交差する方向に、前記圧縮されたウレタンフォームを移動させる第２工程と、
ハ．容器の内壁に沿うガイド片に沿い、容器内に前記圧縮されたウレタンフォームを充填させる第３工程と、よりなるウレタンフォームの圧縮充填方法であり、好ましくは、前記第１工程の後において、圧縮方向と直交する横方向に、若干量圧縮調整する工程を付加した圧縮充填方法にかかるものである。そして、ガイド及びガイド片にあっては、その表面が摩擦係数の小さい樹脂層にて形成され、特に、前記摩擦抵抗の小さい樹脂が、弗素樹脂であることが望ましい。
【０００７】又、ここで使用されるウレタンフォームは、一般に軟質ウレタンフォームが用いられるが、その性状及び形状等は、このウレタンフォームが充填されるキャビテイの大きさ及びその使用目的によって異なる。かかるウレタンフォームは、発泡時のセル膜が付いたままのものであってもよいが、好ましくは、このセル膜を取り除いたいわゆるオープンセルのものが好適に使用されるものである。セル膜を除去したオープンセルフォーム（三次元網状化フォーム）とする方法は、例えばアルカリ水溶液に浸漬することによってなされ、或いは爆発法による方法によりなされたものである。更にこのウレタンフォームの充填状態にあっては、容器のキャビテイ内に圧縮されて充填されるものであるが、一般にはフォームのセルの短径方向に圧縮されるものであって、その圧縮も機械的に圧縮されたものであっても、或いは、例えば熱圧縮により永久変形させたものであってもよい。
【０００８】
【作用】ウレタンフォームの構造にあって、かかるウレタンフォームを構成する泡は、球形と言うよりはむしろ

卵状の泡が連なっているものである。即ち、ウレタンフォームが製造される時、ポリオールとポリイソシアネートとの混合液状原料から立ち上がるが、この立ち上がり方向が泡の長径方向となり、これに直角の方向が泡の短径方向となるものである。しかるに、この長径の方向に合致させてフォームを圧縮させた場合には、うまく均一に圧縮ができず、圧縮むらが生じ、場合によってはこれが原因となって大きなしわが生じてしまう。

【０００９】本発明はウレタンフォームの圧縮方向を限定し、全くしわのない圧縮されたウレタンフォームを容器内に充填しようとする方法にかかり、その圧縮、押圧の方向と順序を規制し、しかも容器内に充填しやすいようになしたもので、かかる方法によって圧縮されたウレタンフォームは、容器内に均質に納まることとなったものである。

【００１０】

【実施例】本発明を実施例を用いて詳細に説明するが、これら実施例により本発明は何ら制限を受けるものではない。図１は、本発明にかかるウレタンフォーム１の一部拡大図である。当該ウレタンフォーム１は、ウレタンフォームの膜を除去したいわゆる三次元網状化ウレタンフォーム（オープンセルフォーム）であって、その膜を除去する方法は爆発法によった。

【００１１】次に、本発明の特徴であるウレタンフォームの圧縮方向であるが、ウレタンフォームを構成する単位泡1_0の短径方向ａであることを特徴とする。即ち、図１において、ｂが長径方向、即ち製造時の原料からの立ち上がり方向であり、ａが短径方向であって、この短径方向ａに圧縮し、容器に充填することを特徴とする。ウレタンフォームを構成する単位泡1_0の短径方向ａか長径方向ｂかは、拡大鏡などによって目視で確認できるが、前記したように、一般にウレタンフォームが製造される時、つまり発泡される時、前記したようにポリエーテルポリオール又はポリエステルポリオールとポリイソシアナートの反応により、液状原料から発泡する発泡方向が長径方向ｂであり、これと直角の方向が短径方向ａの単位泡1_0となるのである。

【００１２】さて次に、液体容器内に前述の圧縮方向に基くウレタンフォームの均一な充填方法を詳述する。図２は、本発明にかかるウレタンフォームの圧縮充填に使用する治具の第１実施例における上面斜視図であり、１０はウレタンフォーム１が嵌込まれる枠体であって、この枠体１０にはシリンダーが３つ備えられている。即ち、枠体１０の長手方向には、第１シリンダー１１が配置されている。しかるに、この枠体１０内にウレタンフォーム１が装填されるが、このウレタンフォーム１は勿論泡の短径方向ａと長径方向ｂとを考慮したものであって、第１シリンダー１１に対して、ウレタンフォーム１の泡の短径方向ａが対向し、上下方向に長径方向ｂが向いている。

【００１３】この状態にあって、第１工程として、第１シリンダー１１をＡ方向に作動して、ウレタンフォーム１を泡の短径方向ａにおいて圧縮する。圧縮率は原形ウレタンフォーム１の約１／３とした。この場合、ウレタンフォーム１の圧縮が均一に行われなくてはならない。圧縮が一部にでも集中すると、単位泡1_0がそこだけ閉鎖密閉されることとなり、しかも、圧縮集中個所がしわ状となってしまい、このまま容器中に充填した場合には、液体がそのしわに沿って流れるという現象を生ずるため、特に均一に圧縮することが必須であり、本発明の重要さがここにある。

【００１４】このため、図２の圧縮すべきウレタンフォーム１は、内面１２を弗素樹脂フィルムにて形成されたガイド１３を枠体１０の周囲に備え、ここにウレタンフォーム１を載置する。この場合、当然本発明の特徴であるウレタンフォーム１の単位泡1_0の短径方向ａを確認の上載置されることは言うまでもない。

【００１５】この例では、第１工程で所定量圧縮したウレタンフォーム1_1を、第１工程と直角に横に交差する方向Ｂで若干の圧縮調整する副工程をとる。この副工程は、図示する如く第２シリンダー１４によってなされるものである。

【００１６】次いで、第１工程と直角に縦に交差する方向Ｃに第３シリンダー１５にて押圧する第２工程に入り、続いて第３工程としてかかるウレタンフォーム1_1を枠体１０内より移動することにより、容器２０内に充填されることになる。図３はこの第３工程の様子を示す図１の側面図である。この場合、容器２０の内壁２１に弗素樹脂フィルムでできた舌片２２を垂下せしめておき、これに沿い確実に容器２０内にウレタンフォーム1_1を充填するものである。

【００１７】以上のように、枠体１０に弗素樹脂フィルムよりなるガイド１３を沿わせ、これに沿って第１工程の圧縮Ａを行い、ここで必要であれば前記第１工程の圧縮方向と横に交差する方向に、充填すべき容器に見合う位置に押圧移動（Ｂ方向）せしめる副工程を経て、前記第１工程と縦に交差する方向に押圧する第２工程を経て、弗素樹脂フィルムよりなる舌片２２に沿って押圧（Ｃ方向）し、所定容器にウレタンフォームを均一に圧縮充填完了する第３工程の、計第１工程、第２工程、第３工程による充填方法であることを特徴とする。本発明により充填されたウレタンフォームの状態は、図４に示すごとく、短径方向ａがしわもなく均質に圧縮され、液体の揺れをなくし、かつ、毛細管現象を助長する構造となる。

【００１８】図５は本発明の第２実施例の治具を示す斜視図である。３０はウレタンフォーム１が嵌込まれる枠体であって、この枠体３０にはシリンダーが４つ備えられている。即ち、枠体３０の長手方向には第１シリンダー３１と第２シリンダー３２が配備されている。かかる

両シリンダー３１及び３２にあっては、舌片31_1、32_1が形成されていて、実質的にはこの舌片31_1、32_1にてウレタンフォームを圧縮することになる。好ましくは、かかる舌片31_1、32_1の表面を摩擦係数の小さい表面としておくべきであり、一般にはテフロンコーテイングがなされる。

【００１９】しかるに、この枠体３０内にウレタンフォーム１が装填されるが、前例と同様に両シリンダー３１、３２に対してセルの形状が短径方向をなして置かれる。そして、この状態において、先づ、シリンダー３２をA位置まで移動し、次いでこのシリンダー３２に向かってシリンダー３１をB位置まで移動する。即ち、シリンダー３１、３２間でウレタンフォームが圧縮されることになる。そして、このウレタンフォームを圧縮したまま両シリンダーをC及びD位置に移動する。かかるC及びDの間隔は通常はA及びBの間隔と同じであり、C位置はシリンダー３２の元来の位置である。

【００２０】この状態にあって、容器４０を舌片21_1、22_1にあてがい、最後に第３シリンダー３３を上方より押し下げ、ウレタンフォームを圧縮した状態を保ちながら舌片21_1、22_1に沿って移動させ、容器４０内にウレタンフォームを充填させるものである。図６は容器４０内にウレタンフォーム１が第３シリンダー３３の上からの押入によって充填された場合の断面側面図である。

【００２１】尚、第４シリンダー３４は舌片22_1を貫通する平板３５を備えたものであって、シリンダー３２を作動されるに際し、前以てウレタンフォーム１の上面を押さえるためのもので、ウレタンフォーム１を圧縮させる工程の前に作動させるためのものであり、これは圧縮されるウレタンフォームの大きさや性状によって必要となるものである。

【００２２】

【発明の効果】以上のように、本発明は圧縮及び押圧の方向が異なる工程により、容器内にウレタンフォームを充填する方法であり、かかるウレタンフォームの充填方法は、圧縮充填すべきウレタンフォームが均一に圧縮充填されるので、例えばこれを燃料容器に用いた場合にあっては、内部の燃料液体に大きな動揺はなく、一方、容器からの燃料液体の排出供給も常に一定の状態を保つこととなり、その効果は大きい。従って、本発明の適用範囲は大きいものであって、燃料容器のみに留まらず、各種油類、ペイント、インク等の供給に供される容器へのウレタンフォームの充填方法として広く使用されるものである。

【図面の簡単な説明】

【図１】第１図は圧縮前のポリウレタンフォームの一部拡大図である。

【図２】図２は本発明にかかるウレタンフォームの圧縮方法の第１実施例に使用する治具の斜視上面図である。

【図３】図３はこの第３工程時の様子を示す図２の側面図である。

【図４】図４は短径方向ａが圧縮されたウレタンフォームの一部拡大図である。

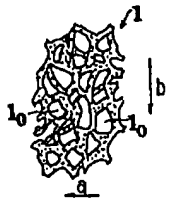
【図５】図５は本発明にかかるウレタンフォームの圧縮方法の第２実施例に使用する治具の斜視上面図である。

【図６】図６は図５に示す治具の第３工程時の様子を示す図５の側面図である。

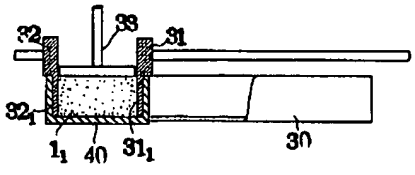
【符号の説明】

１‥‥圧縮前のウレタンフォーム
1_0 ‥‥単位泡
1_1 ‥‥圧縮したウレタンフォーム
１０‥‥枠体
１１‥‥第１シリンダー
１２‥‥枠体内面
１３‥‥ガイド１
１４‥‥第２シリンダー
１５‥‥第３シリンダー
２０‥‥容器
２１‥‥容器内壁
２２‥‥舌片
３０‥‥枠体
３１‥‥第１シリンダー
31_1 ‥‥第１シリンダー舌片
３２‥‥第２シリンダー
32_1 ‥‥第２シリンダー舌片
３３‥‥第３シリンダー
３４‥‥第４シリンダー
３５‥‥平板
４０‥‥容器
ａ‥‥泡の短径方向
ｂ‥‥泡の長径方向

【図１】



【図６】



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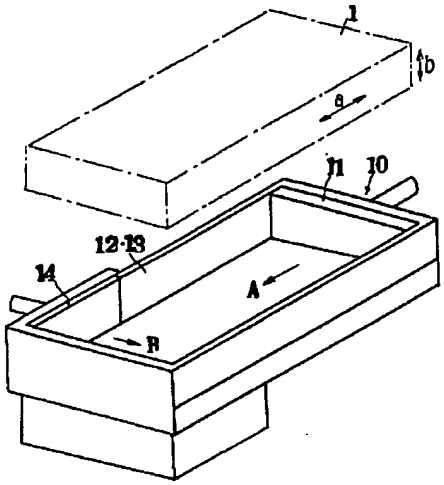
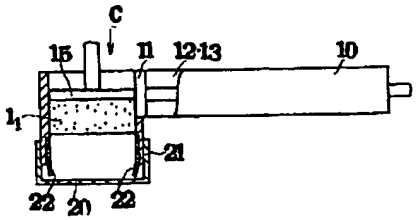
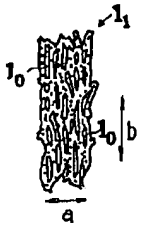

1
b
a
11
10
12·13
14
A
B

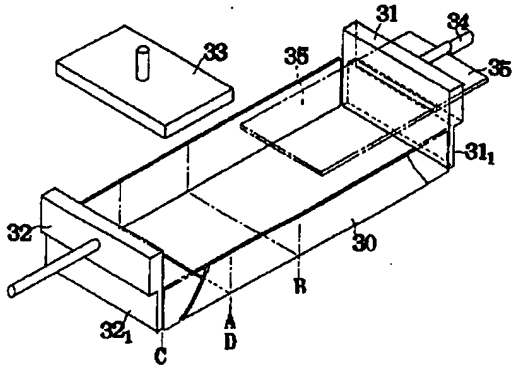
【図３】


C
15
11
12·13
10
1_1
21
22
20
22

【図４】


1_1
1_0
1_0
b
a

【図５】


31
34
33
35
35
31_1
32
30
B
32_1
C
D

* NOTICES *

Japan Patent Office is not responsible for anydamages caused by the use of this translation.
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] The 1st process which is the approach of compressing in the direction a of a minor axis of the unit bubble of urethane foam, and carrying out compression restoration of the urethane foam concerned into a container at homogeneity, and carries out specified quantity compression of the I . urethane foam in the direction a of a minor axis of a unit bubble along with a guide, The compression restoration approach of urethane foam which serves as more the 2nd process which moves said compressed urethane foam in the direction which intersects the 1st process of the RO . above, and length, and the 3rd process which makes it filled up with said compressed urethane foam in a container along with the guide piece in alignment with the wall of the Ha . container.
[Claim 2] The compression restoration approach of the urethane foam given in the 1st term of a claim which added the process which carries out amount compression adjustment a little to the longitudinal direction which intersects perpendicularly with the compression direction after said 1st process.
[Claim 3] A guide and a guide piece are the restoration approach of urethane foam given in the 1st term of a claim that the front face was formed in the resin layer with small coefficient of friction.
[Claim 4] The restoration approach of urethane foam given in the 3rd term of a claim that resin with said small frictional resistance is fluororesin.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the approach of carrying out compression restoration of the urethane foam at homogeneity into containers with which a liquid is stored especially in the interior, such as a fuel container.
[0002]
[Description of the Prior Art] In a liquid container, there is a certain kind of trouble that a container is excited by the dynamic busy condition. It is a fault produced by the dynamic busy condition move [the liquid in a container / to the end in a container], i.e., when the center of gravity of the liquid by migration of the liquid in a container in a dynamic busy condition moves. That is, it is that the sloshing phenomenon within a container arises.

[0003] On the other hand, uniform blowdown is not expectable, if the liquid in a container rocks when discharging the liquid in a container. As a policy which solves these troubles, in order to prevent migration of a liquid, there is a view of being filled up with urethane foam material in a container. For example, the technique currently indicated by JP,42-2103,B is it, and if this is summarized, it is made to be filled up with urethane foam in a container, and even if it is a ********** thing and a container is in a dynamic busy condition about a liquid, large migration of an inner liquid will be aimed at being avoidable.
[0004]
[Problem(s) to be Solved by the Invention] However, there are the following troubles also in this technique. That is, capillarity could not be expected so much from urethane foam only because of only filling up with the urethane foam of the volume which balances in a container, but it was inferior also to liquid hold capacity, when a container was in a dynamic busy condition, migration of a liquid took place not a little, and it was hard to say that blowdown of a liquid is also carried out to homogeneity, and was not able to be said to be what solved the above-mentioned trouble extensively.
[0005] As for compressing urethane foam into homogeneity uniformly, the trouble of being in charge of compressing and being filled up in a container although the data that these faults were removed by being filled up about this point where urethane foam is compressed into a container became clear has the problem of being difficult. If it only compresses to urethane foam, compressive unevenness happens, the unevenness becomes muscle-like and it remains, and the muscle cannot be met, it cannot flow [liquid can focus, and], and effectiveness of said characteristic container cannot be demonstrated.
[0006]
[Means for Solving the Problem] This invention is thought out that the above-mentioned technical problem should be solved, and obtains solution by adopting the next configuration. Namely, the summary of this invention is compressed in the direction a of a minor axis of the unit bubble of urethane foam. The 1st process which is the approach of carrying out compression restoration of the urethane foam concerned into a container at homogeneity, and carries out specified quantity compression of the I . urethane foam in the direction a of a minor axis of a unit bubble along with a guide, The 2nd process which moves said compressed urethane foam in the direction which intersects the 1st process of the RO . above, and length, It is the compression restoration approach of urethane foam which serves as more the 3rd process which makes it filled up with said compressed urethane foam in a container along with the guide piece in alignment with the wall of the Ha . container. Preferably The compression restoration approach which added the process which carries out amount compression adjustment a little to the longitudinal direction which intersects perpendicularly with the compression direction after said 1st process is started. And if it is in a guide and a guide piece, the front face is formed in a resin layer with small coefficient of friction, and it is desirable for resin with said especially small frictional resistance to be fluororesin.
[0007] Moreover, although, as for the urethane foam used here, flexible urethane foam is generally used, that description, configuration, etc. change with the magnitude of the cavity with which this urethane foam is filled up, and its purposes of use. Although this urethane foam may be a thing [that the cel film at the time of foaming is attached], the so-called thing of the open cell which removed this cel film is used suitably preferably. The approach of using as the open cell form (three-dimensions reticulated-ized form) from which the cel film was removed is made by being immersed for example, in an alkali water solution, or is made by the approach by the

explosion method. Furthermore, even if it is generally compressed in the direction of a minor axis of the cel of form and that compression is also mechanically compressed although it compresses and fills up in the cavity of a container if it is in the restoration condition of this urethane foam, permanent deformation may be carried out for example, by heat compression.
[0008]
[Function] The egg-like bubble stands in a row rather rather than the bubble which is in the structure of urethane foam and constitutes this urethane foam is called globular form. That is, although it starts from the mixed liquor-like raw material of polyol and the poly isocyanate when urethane foam is manufactured, this direction of a standup turns into the major-axis direction of a bubble, and the direction of a right angle turns into the direction of a minor axis of a bubble at this. However, when it is made to agree in this major-axis direction and form is made to compress, compression is well impossible for homogeneity, compression unevenness arises, depending on the case, this will become a cause and a big wrinkling will arise.
[0009] It is what was made as [be / moreover / this invention limits the compression direction of urethane foam, and starts the approach which it is going to fill up with the compressed urethane foam without a wrinkling in a container, the direction and sequence of the compression and press are regulated, and / it / easy to be filled up in a container], and the urethane foam compressed by the approach of starting will be restored to homogeneity in a container.
[0010]
[Example] Although this invention is explained to a detail using an example, this invention does not receive a limit at all according to these examples. a part of urethane foam 1 which drawing 1 requires for this invention -- it is an enlarged drawing. The urethane foam 1 concerned is the so-called three-dimensions reticulated-ized urethane foam (open cell form) which removed the film of urethane foam, and depended the approach of removing the film on the explosion method.
[0011] Next, unit bubble 10 which constitutes urethane foam although it is the compression direction of the urethane foam which is the description of this invention It is characterized by being the direction a of a minor axis. That is, in drawing 1 , b is the major-axis direction of a standup, i.e., the direction from the raw material at the time of manufacture, and a is the direction of a minor axis, and it compresses in this direction a of a minor axis, and is characterized by filling up a container. Unit bubble 10 which constitutes urethane foam Although the direction a of a minor axis and the major-axis direction b can be visually checked with a magnifier etc. When [at which urethane foam is generally manufactured] foamed at the time that is, as were described above and described above, by the reaction of polyether polyol or polyester polio-RU, and polyisocyanate The foaming direction in which it foams from a liquefied raw material is the major-axis direction b, and the direction of this and a right angle is the unit bubble 10 of the direction a of a minor axis. It becomes.
[0012] Now, next, the uniform restoration approach of urethane foam based on the above-mentioned compression direction is explained in full detail in a liquid container. Drawing 2 is a top-face perspective view in the 1st example of the fixture used for compression restoration of the urethane foam concerning this invention, 10 is a frame in which urethane foam 1 is inserted, and this frame 10 is equipped with three cylinders. That is, 11 [cylinder / 1st] is arranged at the longitudinal direction of a frame 10. However, although loaded with urethane foam 1 into this frame 10, of course, in consideration of the direction a of a minor axis of a bubble, and the major-axis direction b, to 11, the direction a of a minor axis of the bubble of urethane foam 1 countered, and the major-axis direction b has turned to the 1st cylinder of this urethane foam 1 in the vertical direction.

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[0013] It is in this condition, the 1st cylinder operates 11 in the direction of A as the 1st process, and urethane foam 1 is compressed in the direction a of a minor axis of a bubble. Compressibility was made into the abbreviation 1/3 of original-form urethane foam 1. In this case, compression of urethane foam 1 must be carried out to homogeneity. When compression concentrates even on a part, it is the unit bubble 10. Closeout sealing only of there will be carried out, moreover, since the phenomenon in which a liquid flows in accordance with that wrinkling is produced when a compression concentration part becomes wrinkling-like and it is filled up into a container as it is, compressing especially into homogeneity is indispensable and here is the importance of this invention.
[0014] For this reason, the urethane foam 1 which should compress drawing 2 equips the perimeter of a frame 10 with the guide 13 formed with the fluororesin film in the inner surface 12, and lays urethane foam 1 here. In this case, unit bubble 10 of the urethane foam 1 which is naturally the description of this invention It cannot be overemphasized that it is laid after checking the direction a of a minor axis.
[0015] Urethane foam 11 which carried out specified quantity compression at the 1st process in this example The subprocess in which some carries out compression adjustment in the direction B which intersects the 1st process and a right angle horizontally is taken. The 2nd cylinder of this subprocess is made by 14 so that it may illustrate.
[0016] Subsequently, the 2nd process pressed in 15 the 3rd cylinder in the direction C which intersects the 1st process and a right angle perpendicularly is entered and followed, and it is this urethane foam 11 as the 3rd process. By moving from the inside of a frame 10, it will fill up in a container 20. Drawing 3 is the side elevation of drawing 1 showing the situation of this 3rd process. In this case, the tongue-shaped piece 22 made into the wall 21 of a container 20 with the fluororesin film is made to hang, this is met, and it is urethane foam 11 in a container 20 certainly. It is filled up.
[0017] As mentioned above, the guide 13 which becomes a frame 10 from a fluororesin film is made to meet. Along with this, perform compression A of the 1st process, and if required here, in the compression direction of said 1st process, and the direction which crosses horizontally Pass the subprocess out of which it cheats press migration (the direction of B) in the location corresponding to the container with which it should be filled up. Along with the tongue-shaped piece 22 which consists of a fluororesin film, it presses through the 2nd process pressed in the direction which intersects said 1st process and length (the direction of C). the total of the 3rd process which carries out the completion of compression restoration of the urethane foam at homogeneity at a predetermined container -- it is characterized by being the restoration approach by the 1st process, the 2nd process, and the 3rd process. The condition of the urethane foam with which this invention was filled up serves as structure which a wrinkling does not have the direction a of a minor axis, either, is compressed into homogeneity, and loses the shake of a liquid, and promotes capillarity, as shown in drawing 4 .
[0018] Drawing 5 is the perspective view showing the fixture of the 2nd example of this invention. 30 is a frame in which urethane foam 1 is inserted, and this frame 30 is equipped with four cylinders. That is, 32 [cylinder / 1st / cylinder / 2nd] is arranged by the longitudinal direction of a frame 30 with 31. If it is in both these cylinders 31 and 32, it is a tongue-shaped piece 311 and 321. It is formed and is this tongue-shaped piece 311 and 321 substantially. Urethane foam will be compressed. Preferably, it is this tongue-shaped piece 311 and 321. The front face should be used as the front face where coefficient of friction is small, and, generally TEX RONKO-TEINGU is made.

Publ'n No.: JP 05-000463 Publ'n Date: 08.01.1993

[0019] However, although loaded with urethane foam 1 into this frame 30, like a precedent, to both the cylinders 31 and 32, the configuration of a cel makes the direction of a minor axis, and is placed. And in this condition, point ** and a cylinder 32 are moved to A location, and, subsequently a cylinder 31 is moved to B location toward this cylinder 32. That is, urethane foam will be compressed between a cylinder 31 and 32. And both cylinders are moved to C and D location, with this urethane foam compressed. This spacing of C and D is usually the same as spacing of A and B, and C location is an original location of a cylinder 32.
[0020] It is in this condition and is a container 40 A tongue-shaped piece 211 and 221 It is a tongue-shaped piece 211 and 221, maintaining the condition of having assigned, having depressed 33 [cylinder / 3rd] more nearly finally than the upper part, and having compressed urethane foam. It meets, and you make it move and make it filled up with urethane foam in a container 40. Drawing 6 is a cross-section side elevation when the closet from 33 is filled up with the 3rd cylinder of urethane foam 1 in a container 40.
[0021] In addition, 34 is a tongue-shaped piece 221 the 4th cylinder. It has the plate 35 to penetrate and a cylinder 32 is faced operating, it is for pressing down the top face of urethane foam 1 beforehand, and this is [it is for making it operate before the process into which urethane foam 1 is made to compress, and] needed with the magnitude and description of urethane foam which are compressed.
[0022]
[Effect of the Invention] As mentioned above, if it is when this is used for a fuel container, for example, since the compression restoration of the urethane foam which is the approach filled up with urethane foam in a container according to the process from which, as for this invention, the direction of compression and press differs, and the restoration approach of this urethane foam should carry out compression restoration was carried out at homogeneity, there is no big oscillation into an internal fuel liquid, the condition that blowdown supply of the fuel liquid from a container is also always fixed on the other hand will be maintained, and the effectiveness is large. Therefore, the applicability of this invention is large, and it does not stop only at a fuel container, but is widely used as the restoration approach of the urethane foam to the container with which supply of various oil, paint, ink, etc. is presented.

TECHNICAL FIELD

[Industrial Application] This invention relates to the approach of carrying out compression restoration of the urethane foam at homogeneity into containers with which a liquid is stored especially in the interior, such as a fuel container.

PRIOR ART

[Description of the Prior Art] In a liquid container, there is a certain kind of trouble that a container is excited by the dynamic busy condition. It is a fault produced by the dynamic busy condition move [the liquid in a container / to the end in a container], i.e., when the center of gravity of the liquid by migration of the liquid in a container in a dynamic busy condition moves. That is, it is that the sloshing phenomenon within a container arises.

[0003] On the other hand, uniform blowdown is not expectable, if the liquid in a container rocks when discharging the liquid in a container. As a policy which solves these troubles, in order to prevent migration of a liquid, there is a view of being filled up with urethane foam material in a container. For example, the technique currently indicated by JP,42-2103,B is it, and if this is summarized, it is made to be filled up with urethane foam in a container, and even if it is a ********** thing and a container is in a dynamic busy condition about a liquid, large migration of an inner liquid will be aimed at being avoidable.

EFFECT OF THE INVENTION

[Effect of the Invention] As mentioned above, if it is when this is used for a fuel container, for example, since the compression restoration of the urethane foam which is the approach filled up with urethane foam in a container according to the process from which, as for this invention, the direction of compression and press differs, and the restoration approach of this urethane foam should carry out compression restoration was carried out at homogeneity, there is no big oscillation into an internal fuel liquid, the condition that blowdown supply of the fuel liquid from a container is also always fixed on the other hand will be maintained, and the effectiveness is large. Therefore, the applicability of this invention is large, and it does not stop only at a fuel container, but is widely used as the restoration approach of the urethane foam to the container with which supply of various oil, paint, ink, etc. is presented.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, there are the following troubles also in this technique. That is, capillarity could not be expected so much from urethane foam only because of only filling up with the urethane foam of the volume which balances in a container, but it was inferior also to liquid hold capacity, when a container was in a dynamic busy condition, migration of a liquid took place not a little, and it was hard to say that blowdown of a liquid is also carried out to homogeneity, and was not able to be said to be what solved the above-mentioned trouble extensively.

[0005] As for compressing urethane foam into homogeneity uniformly, the trouble of being in charge of compressing and being filled up in a container although the data that these faults were removed by being filled up about this point where urethane foam is compressed into a container became clear has the problem of being difficult. If it only compresses to urethane foam, compressive unevenness happens, the unevenness becomes muscle-like and it remains, and the muscle cannot be met, it cannot flow [liquid can focus, and], and effectiveness of said characteristic container cannot be demonstrated.

MEANS

[Means for Solving the Problem] This invention is thought out that the above-mentioned technical problem should be solved, and obtains solution by adopting the next configuration. Namely, the summary of this invention is compressed in the direction a of a minor axis of the

unit bubble of urethane foam. The 1st process which is the approach of carrying out compression restoration of the urethane foam concerned into a container at homogeneity, and carries out specified quantity compression of the I . urethane foam in the direction a of a minor axis of a unit bubble along with a guide, The 2nd process which moves said compressed urethane foam in the direction which intersects the 1st process of the RO . above, and length, It is the compression restoration approach of urethane foam which serves as more the 3rd process which makes it filled up with said compressed urethane foam in a container along with the guide piece in alignment with the wall of the Ha . container. Preferably The compression restoration approach which added the process which carries out amount compression adjustment a little to the longitudinal direction which intersects perpendicularly with the compression direction after said 1st process is started. And if it is in a guide and a guide piece, the front face is formed in a resin layer with small coefficient of friction, and it is desirable for resin with said especially small frictional resistance to be fluororesin.

[0007] Moreover, although, as for the urethane foam used here, flexible urethane foam is generally used, that description, configuration, etc. change with the magnitude of the cavity with which this urethane foam is filled up, and its purposes of use. Although this urethane foam may be a thing [that the cel film at the time of foaming is attached], the so-called thing of the open cell which removed this cel film is used suitably preferably. The approach of using as the open cell form (three-dimensions reticulated-ized form) from which the cel film was removed is made by being immersed for example, in an alkali water solution, or is made by the approach by the explosion method. Furthermore, even if it is generally compressed in the direction of a minor axis of the cel of form and that compression is also mechanically compressed although it compresses and fills up in the cavity of a container if it is in the restoration condition of this urethane foam, permanent deformation may be carried out for example, by heat compression.

OPERATION

[Function] The egg-like bubble stands in a row rather rather than the bubble which is in the structure of urethane foam and constitutes this urethane foam is called globular form. That is, although it starts from the mixed liquor-like raw material of polyol and the poly isocyanate when urethane foam is manufactured, this direction of a standup turns into the major-axis direction of a bubble, and the direction of a right angle turns into the direction of a minor axis of a bubble at this. However, when it is made to agree in this major-axis direction and form is made to compress, compression is well impossible for homogeneity, compression unevenness arises, depending on the case, this will become a cause and a big wrinkling will arise.

[0009] It is what was made as [be / moreover / this invention limits the compression direction of urethane foam, and starts the approach which it is going to fill up with the compressed urethane foam without a wrinkling in a container, the direction and sequence of the compression and press are regulated, and / it / easy to be filled up in a container], and the urethane foam compressed by the approach of starting will be restored to homogeneity in a container.

EXAMPLE

[Example] Although this invention is explained to a detail using an example, this invention does not receive a limit at all according to these examples. a part of urethane foam 1 which drawing 1 requires for this invention -- it is an enlarged drawing. The urethane foam 1 concerned is the so-called three-dimensions reticulated-ized urethane foam (open cell form) which removed the film of urethane foam, and depended the approach of removing the film on the explosion method.
[0011] Next, unit bubble 10 which constitutes urethane foam although it is the compression direction of the urethane foam which is the description of this invention It is characterized by being the direction a of a minor axis. That is, in drawing 1 , b is the major-axis direction of a standup, i.e., the direction from the raw material at the time of manufacture, and a is the direction of a minor axis, and it compresses in this direction a of a minor axis, and is characterized by filling up a container. Unit bubble 10 which constitutes urethane foam Although the direction a of a minor axis and the major-axis direction b can be visually checked with a magnifier etc. When [at which urethane foam is generally manufactured] foamed at the time that is, as were described above and described above, by the reaction of polyether polyol or polyester polio-RU, and polyisocyanate The foaming direction in which it foams from a liquefied raw material is the major-axis direction b, and the direction of this and a right angle is the unit bubble 10 of the direction a of a minor axis. It becomes.
[0012] Now, next, the uniform restoration approach of urethane foam based on the above-mentioned compression direction is explained in full detail in a liquid container. Drawing 2 is a top-face perspective view in the 1st example of the fixture used for compression restoration of the urethane foam concerning this invention, 10 is a frame in which urethane foam 1 is inserted, and this frame 10 is equipped with three cylinders. That is, 11 [cylinder / 1st] is arranged at the longitudinal direction of a frame 10. However, although loaded with urethane foam 1 into this frame 10, of course, in consideration of the direction a of a minor axis of a bubble, and the major-axis direction b, to 11, the direction a of a minor axis of the bubble of urethane foam 1 countered, and the major-axis direction b has turned to the 1st cylinder of this urethane foam 1 in the vertical direction.
[0013] It is in this condition, the 1st cylinder operates 11 in the direction of A as the 1st process, and urethane foam 1 is compressed in the direction a of a minor axis of a bubble. Compressibility was made into the abbreviation 1/3 of original-form urethane foam 1. In this case, compression of urethane foam 1 must be carried out to homogeneity. When compression concentrates even on a part, it is the unit bubble 10. Closeout sealing only of there will be carried out, moreover, since the phenomenon in which a liquid flows in accordance with that wrinkling is produced when a compression concentration part becomes wrinkling-like and it is filled up into a container as it is, compressing especially into homogeneity is indispensable and here is the importance of this invention.
[0014] For this reason, the urethane foam 1 which should compress drawing 2 equips the perimeter of a frame 10 with the guide 13 formed with the fluororesin film in the inner surface 12, and lays urethane foam 1 here. In this case, unit bubble 10 of the urethane foam 1 which is naturally the description of this invention It cannot be overemphasized that it is laid after checking the direction a of a minor axis.
[0015] Urethane foam 11 which carried out specified quantity compression at the 1st process in this example The subprocess in which some carries out compression adjustment in the direction B which intersects the 1st process and a right angle horizontally is taken. The 2nd cylinder of this subprocess is made by 14 so that it may illustrate.

[0016] Subsequently, the 2nd process pressed in 15 the 3rd cylinder in the direction C which intersects the 1st process and a right angle perpendicularly is entered and followed, and it is this urethane foam 11 as the 3rd process. By moving from the inside of a frame 10, it will fill up in a container 20. Drawing 3 is the side elevation of drawing 1 showing the situation of this 3rd process. In this case, the tongue-shaped piece 22 made into the wall 21 of a container 20 with the fluororesin film is made to hang, this is met, and it is urethane foam 11 in a container 20 certainly. It is filled up.

[0017] As mentioned above, the guide 13 which becomes a frame 10 from a fluororesin film is made to meet. Along with this, perform compression A of the 1st process, and if required here, in the compression direction of said 1st process, and the direction which crosses horizontally Pass the subprocess out of which it cheats press migration (the direction of B) in the location corresponding to the container with which it should be filled up. Along with the tongue-shaped piece 22 which consists of a fluororesin film, it presses through the 2nd process pressed in the direction which intersects said 1st process and length (the direction of C). the total of the 3rd process which carries out the completion of compression restoration of the urethane foam at homogeneity at a predetermined container -- it is characterized by being the restoration approach by the 1st process, the 2nd process, and the 3rd process. The condition of the urethane foam with which this invention was filled up serves as structure which a wrinkling does not have the direction a of a minor axis, either, is compressed into homogeneity, and loses the shake of a liquid, and promotes capillarity, as shown in drawing 4 .

[0018] Drawing 5 is the perspective view showing the fixture of the 2nd example of this invention. 30 is a frame in which urethane foam 1 is inserted, and this frame 30 is equipped with four cylinders. That is, 32 [cylinder / 1st / cylinder / 2nd] is arranged by the longitudinal direction of a frame 30 with 31. If it is in both these cylinders 31 and 32, it is a tongue-shaped piece 311 and 321. It is formed and is this tongue-shaped piece 311 and 321 substantially. Urethane foam will be compressed. Preferably, it is this tongue-shaped piece 311 and 321. The front face should be used as the front face where coefficient of friction is small, and, generally TEX RONKO-TEINGU is made.

[0019] However, although loaded with urethane foam 1 into this frame 30, like a precedent, to both the cylinders 31 and 32, the configuration of a cel makes the direction of a minor axis, and is placed. And in this condition, point ** and a cylinder 32 are moved to A location, and, subsequently a cylinder 31 is moved to B location toward this cylinder 32. That is, urethane foam will be compressed between a cylinder 31 and 32. And both cylinders are moved to C and D location, with this urethane foam compressed. This spacing of C and D is usually the same as spacing of A and B, and C location is an original location of a cylinder 32.

[0020] It is in this condition and is a container 40 A tongue-shaped piece 211 and 221 It is a tongue-shaped piece 211 and 221, maintaining the condition of having assigned, having depressed 33 [cylinder / 3rd] more nearly finally than the upper part, and having compressed urethane foam. It meets, and you make it move and make it filled up with urethane foam in a container 40. Drawing 6 is a cross-section side elevation when the closet from 33 is filled up with the 3rd cylinder of urethane foam 1 in a container 40.

[0021] In addition, 34 is a tongue-shaped piece 221 the 4th cylinder. It has the plate 35 to penetrate and a cylinder 32 is faced operating, it is for pressing down the top face of urethane foam 1 beforehand, and this is [it is for making it operate before the process into which urethane foam 1 is made to compress, and] needed with the magnitude and description of urethane foam which are compressed.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] drawing 1 -- a part of polyurethane foam before compression -- it is an enlarged drawing.
[Drawing 2] Drawing 2 is the strabism plan of the fixture used for the 1st example of the compression approach of the urethane foam concerning this invention.
[Drawing 3] Drawing 3 is the side elevation of drawing 2 showing the situation at the time of this 3rd process.
[Drawing 4] a part of urethane foam where, as for drawing 4 , the direction a of a minor axis was compressed -- it is an enlarged drawing.
[Drawing 5] Drawing 5 is the strabism plan of the fixture used for the 2nd example of the compression approach of the urethane foam concerning this invention.
[Drawing 6] Drawing 6 is the side elevation of drawing 5 showing the situation at the time of the 3rd process of the fixture shown in drawing 5 .
[Description of Notations]
1 .... Urethane foam before compression
10 .... Unit Bubble
11 .... Compressed Urethane Foam
10 .... Frame
11 .... The 1st cylinder
12 .... Frame inner surface
13 .... Guide 1
14 .... The 2nd cylinder
15 .... The 3rd cylinder
20 .... Container
21 .... Container wall
22 .... Tongue-shaped piece
30 .... Frame
31 .... The 1st cylinder
311 .... 1st Cylinder Tongue-shaped Piece
32 .... The 2nd cylinder
321 .... 2nd Cylinder Tongue-shaped Piece
33 .... The 3rd cylinder
34 .... The 4th cylinder
35 .... Plate
40 .... Container
a .... The direction of a minor axis of a bubble
b .... The major-axis direction of a bubble